

CLAIMS

What is claimed is:

1. A virtual routing system, comprising:

5 a memory divided into a configurable number of context areas for a corresponding set of virtual private routed networks (VPRNs), each context area including a routing table and associated routing protocol state information for the corresponding VPRN, each VPRN employing a respective routing
10 protocol and network address space;

a set of one or more routing tasks, the set including at least one routing task for each different type of routing protocol employed in the set of VPRNs, each routing task being operable only with a separate routing table and with separate routing
15 protocol state information to realize a corresponding virtual router to carry out associated routing operations in a VPRN; and

context selection logic operative to selectively couple the routing tasks to the different context areas of the memory to realize a set of virtual routers, each virtual router being
20 associated with a corresponding one of the VPRNs.

2. A virtual routing system according to claim 1, wherein the set of routing tasks includes at least one Open Shortest Path First (OSPF) routing task and at least one Border Gateway Protocol (BGP)
25 routing task.

3. A virtual routing system according to claim 1, further comprising a set of virtual interfaces operative to translate between generic interface identifiers used by the virtual routers and physical interface information for physical network links to
30 which the virtual routing system is connected.

4. A virtual routing system according to claim 3, wherein the physical network links to which the virtual routing system is connected employ label switched paths, and wherein the set of virtual interfaces include virtual interfaces containing information for encapsulating and attaching labels to packets on the label switched paths.

5. A virtual routing system according to claim 1, wherein the selective coupling of the routing tasks to the different context areas of the memory is performed at the rate at which protocol packets for the various VPRNs are received by the virtual routing system.

6. A method of operating a routing system, comprising:

maintaining a number of context areas in a memory for a corresponding set of virtual private routed networks (VPRNs), each context area including a routing table and associated routing protocol state information for the corresponding VPRN, each VPRN employing a respective routing protocol and network address space;

executing a set of one or more routing tasks, the set including at least one routing task for each different type of routing protocol employed in the set of VPRNs, each routing task being operable only with a separate routing table and with separate routing protocol state information to realize a corresponding virtual router to carry out associated routing operations in a VPRN; and

selectively coupling the routing tasks to the different context areas of the memory to realize a set of virtual routers, each virtual router being associated with a corresponding one of the VPRNs.

7. A method according to claim 6, wherein the set of routing tasks includes at least one Open Shortest Path First (OSPF) routing task and at least one Border Gateway Protocol (BGP) routing task.

5 8. A method according to claim 6, further comprising maintaining a set of virtual interfaces operative to translate between generic interface identifiers used by the virtual routers and physical interface information for physical network links to which the virtual routing system is connected.

10 9. A method according to claim 8, wherein the physical network links to which the virtual routing system is connected employ label switched paths, and wherein the set of virtual interfaces include virtual interfaces containing information for
15 encapsulating and attaching labels to packets on the label switched paths.

20 10. A method according to claim 6, wherein the selective coupling of the routing tasks to the different context areas of the memory is performed at the rate at which protocol packets for the various VPRNs are received by the virtual routing system.